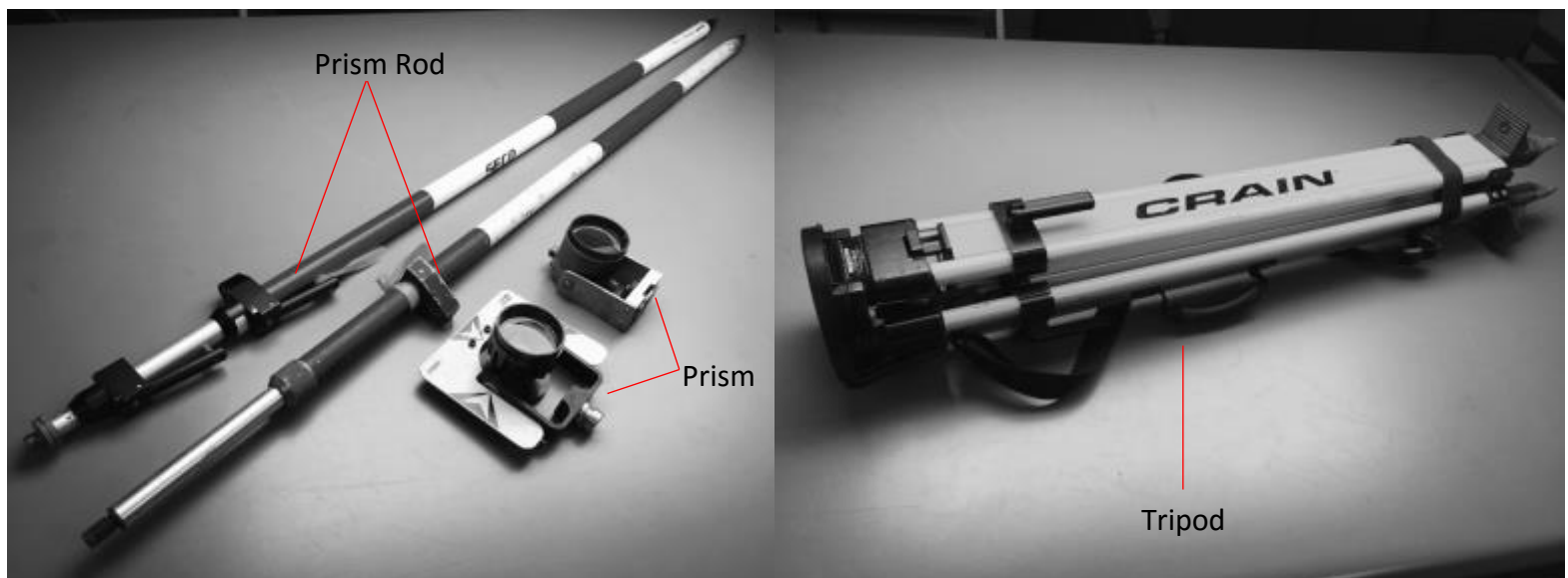
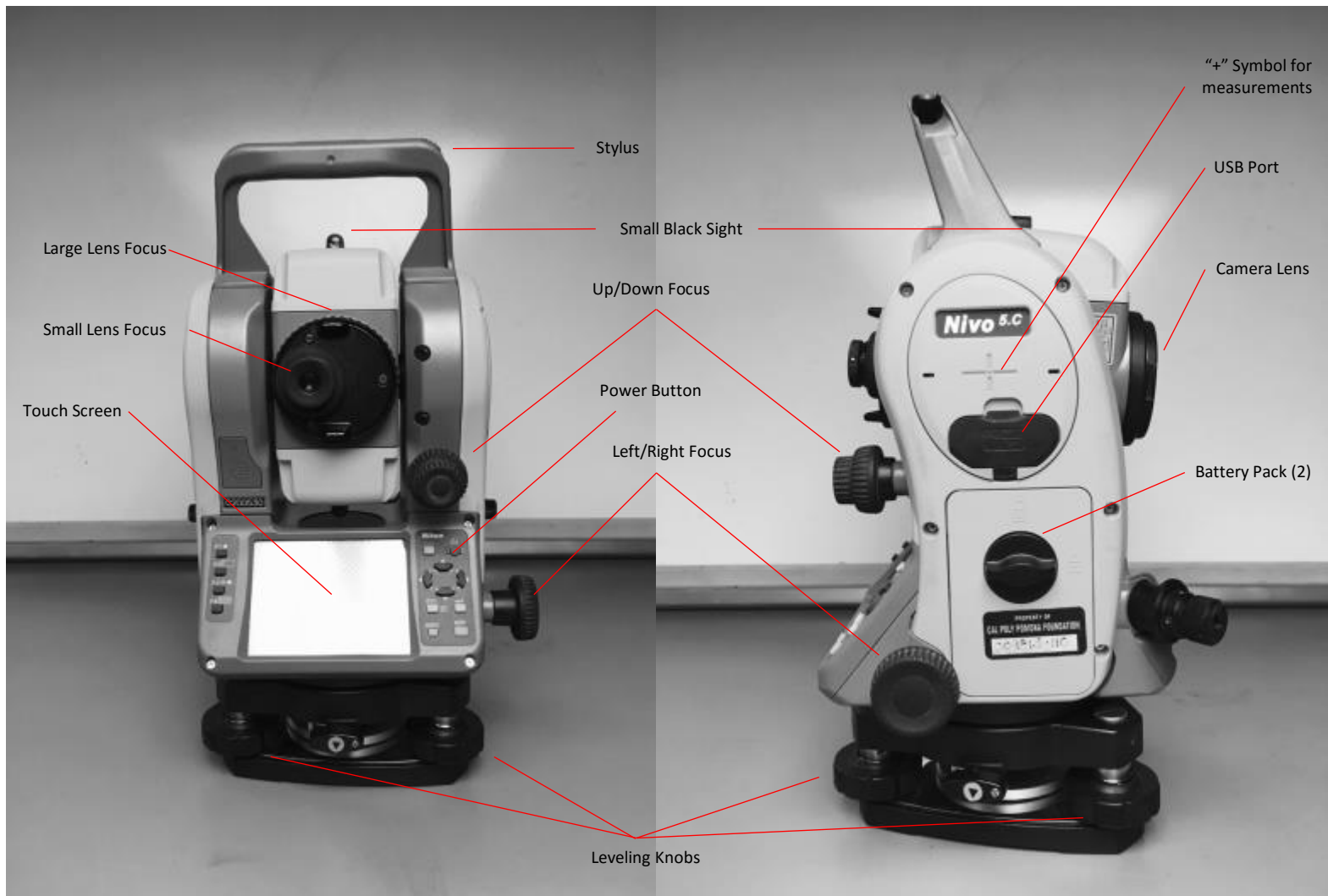





Manual for Total Station Set Up and Usage (feedback appreciated)



Tripod Setup

1. Set the tripod legs wide enough for maximum stability (so that wind will not knock it over) and adjust the height to accommodate the tallest and shortest member in your group who will be working with the total station and not the prisms. Below is an example of a set up tripod
2. Stomp the legs in securely into the dirt to ensure no motion after you set them
 - If you cannot stomp the legs in sufficiently, pile rocks around the bases of the legs
3. Using a Brunton, make sure the tripod is level (doing this now will minimize future headaches)
4. Remove the black cap from the tripod base to reveal the metal platform

Total Station Setup

5. Grab the total station unit from the orange box using one hand on the top handle and the other hand under the base
6. Set the total station on top of the tripod base and securely fasten the total station with the screw located beneath the metal platform on the tripod
7. Remove Nikon lens cap and place back in orange box immediately
8. If the level on the base of the total station is not leveled, twist the adjustment knobs until the unit is level
9. Remove the stylus from the top of the handle.
Use stylus at all times
10. Press the red power button
11. Double tap “Survey Pro”
12. A new level bubble menu will appear
 - Level the bubble within +/- 10”
 - Once leveled, hit the green ⊗ in the top right corner to confirm. The “Quick Shot” menu will appear
13. Make sure this prism symbol  is showing to the right of the HR input box. If it is not, make sure “My Prism” is selected in the drop down menu to the right of the  symbol, and make sure the drop down menu to the right of that is set to “Normal”.
14. Select the  button at the top right corner. The “Settings” menu will appear.
15. Ensure that the following is selected:
 - Units for Distance – “Meters”
 - Units for Angle – “Degree”
 - Display Direction as – “Azimuth”
 - Azimuth Type – “North Azimuth”
 - Coord. Order – “N, E, Elev.”
16. Select the green ⊗ in the top right corner to return to the “Quick Shot” menu





17. Select the big folder button on the right side of the screen. The “Welcome to Survey Pro” menu will appear
 18. To create a new job, select the box that says “New...”
 19. The “New Job” menu will appear. Enter the site name and either your group name or the date as the job name. Write down your file name on the data sheet
 20. Select “Next” and the “New Job” menu will appear.
-

Now you must check your total station version number


21. If your total station number (above the screen and to the left) reads:
 - a. C200530 – you have **Version 4.8**
 - b. C200453 – you have **Version 4.11**
-

C200530 – Version 4.8

22. Ensure that the following is selected:
 - Azimuth Type – “North Azimuth”
 - Units for Distance – “Meters”
 - Units for Angles – “Degrees”
 - Make sure that “Adjust for Earth Curvature/ Refraction” is checked
 - Make sure that “Use Scale Factor” is not checked
23. Select “Next”
24. Now you are entering information to describe your total station location
 - a. Enter your group name for the point name
 - b. Use a handheld GPS and input the “Northing” and “Easting” into your total station
 - c. Ensure “Elevation” is at “1000.0 m”. It is not necessary to get an accurate elevation measurement as we are more interested in changes in elevation relative to the total station
25. Select “Finish” to return to the “Quick Shot” menu
26. ***BACKSIGHT IS NOT SET*** will be seen on “Quick Shot” menu
27. Select the green ⊗ in the top right corner
28. This takes you to your job menu with the job title you chose
29. Choose “Survey” and a submenu appears on the right
30. Choose “Backsight Setup” and the “Backsight Setup” menu will appear
31. Here, the “HI” (Height Instrument) needs to be set in meters
 - Measure **from the ground**, straight up to the **middle of the “+” sign on the side of total station**. Refer to Page 1 for pictures of the side of the prism if you cannot find the “+”
32. Enter the height of your rod “HR” in meters
 - Screw the prism to the rod (refer to Page 1 for pictures of the two prisms)
 - Measure the height of the rod from the **very bottom tip of the rod** up to the **middle of the prism** (the tip of the arrow for the larger prism or the center of the screw for the smaller prism)
33. Write down the values for HR and HI on your data sheet
34. The “Fixed Backsight HR” should be checked and set to “0.000 m”.
35. “Backsight Circle” should say 0°00’00”
36. Using your Brunton, send a group member to **geographic North** with the **Prism Rod** (at least 10m)

37. In the drop down menu next to **"Occupy Point"**, select your group name
38. Use the **black small sight at the top of the total station** to aim your total station towards your group member at North with a walkie
39. Find them through the total station sight now
 - The **Large lens focus** focuses the **image**
 - The **Small lens focus** focuses the **crosshairs** seen within the lens
 - The **knob above the power button** will **adjust the camera up and down**
 - The **knob on the right side of the total station** will **adjust the camera to the right and left**
40. Once your group members have the prism leveled and facing the camera, make sure the crosshairs on the total station camera are lined up with the prism crosshairs
41. Select **"Solve"**
42. Select **"Send Circle"**
43. Select **"Store Backsight Point"**
44. Press **"Ok"** to take a shot
45. Label your point **"1"** and name your point under **"Description"** (if you are taking measurements of monuments or specific locations, this is where you can enter in that description. Otherwise you can label this **"1"** as well)
46. While your group members are still in the North location and the prism is in sight, select **"By Distance"**. When the unit finishes taking a shot, select **"By Angle"**. Your group members can move to the next point.
47. A map will appear, hit the green  in the top right corner then  in the top right corner on the next screen. The **"Main Menu"** will appear.

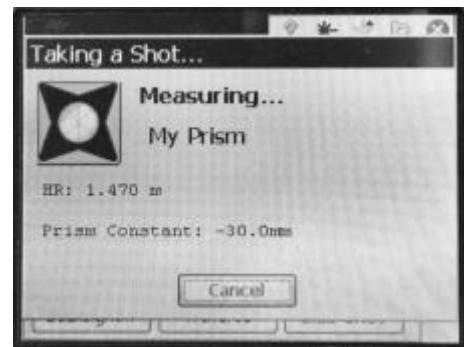
C200453 – Version 4.11

24. Ensure that the following is selected:
 - Azimuth Type – **"North Azimuth"**
 - Units for Distance – **"Meters"**
 - Units for Angles – **"Degrees"**
 - Make sure that **"Adjust for Earth Curvature/ Refraction"** is checked
25. Select **"Next"**
26. Now you are entering your total station base information
 - a. Name your point **"base"**
 - b. Use a handheld GPS and input the **"Northing"** and **"Easting"** into your total station
 - c. Ensure **"Elevation"** is at **"1000.0 m"**. It is not necessary to get an accurate GPS point as we are more interested in changes in elevation relative to the total station
27. *****BACKSIGHT IS NOT SET***** will be seen on **"Quick Shot"** menu
28. Select the green  in the top right corner
29. This takes you to your job menu with the job title you chose
30. Choose **"Survey"** and a submenu appear on the right
31. Choose **"Station Setup"** and the **"Station Setup"** menu will appear
32. Here, **"HI"** (Height Instrument) needs to be set
 - **Measure from the the ground**, straight up to the **middle of the "+" sign on the side of total station**
33. Select **"Next"**
34. The **"BS Azimuth:"** needs to be set to **0.00**
35. The **"Backsight Circle:"** needs to be set to **0.0000**
36. **"Fixed Target"** must be selected from the drop down menu and **"HR:"** must be set to **0.000 m**

37. Select **"Send Circle"**
38. Using your Brunton, send a group member to **geographic North** with the **Prism Rod**
39. Use the **black small sight at the top of the total station** to aim your total station towards your group member at North
40. Find them through the total station sight now
 - a. The **Large lens focus** focuses the **image**
 - b. The **Small lens focus** focuses the **crosshairs** seen within the lens
 - c. The **knob above the power button** will **adjust the camera up and down**
 - d. The **knob on the right side of the total station** will **adjust the camera to the right and left**
41. Once the prism is leveled, facing the camera, and the crosshairs on the total station camera are lined up with the prism crosshairs, select **"Measure Backsight"** and select **"OK"**
42. The **"New Point"** menu pops up. Your group members can move to the next point
43. Name the point **"North"**
44. Click outside of the keyboard to exit the keyboard and select the **green** ⌂ in the top right to return to the **"Station Setup"** menu
45. Select **"Finish"** and the job menu will reappear

Data Collection

46. Make sure **"Survey"** is highlighted then select **"Traverse/Sideshot"**
47. Foresight: **"1"** is the default title of the first shot and will **progress after each shot automatically**
48. Your group members should be at the first location.
When the prism is level and facing the camera, you can take your first shot. Select **"Sideshot"** and the total station **will begin shooting the prism**. Ensure the prism is leveled until the total station completes the shot. **Make sure to verbally communicate with your group member that you are ready to shoot and once the shot is completed**
49. After the shot is completed, you can now describe your shot under **"Description"**
 - a. Change **"Description"** as necessary
50. Select the **green** ⌂ next to **"New Point"**.
51. The **"Traverse/Sideshot"** menu reappears
52. Continue shooting until job is complete



To turn total station off

53. When shooting has completed, hit the **red power button**
54. The **"Power Key"** menu will appear
55. Select **"Options"**
56. Select **"Shut Down"**
57. Select **"Yes"**

Charging the Batteries

Both Total Stations contain **two** batteries in them. It is **EXTREMELY IMPORTANT** that you **DO NOT** take out **both of the batteries** at the same time, or all of the data saved in them are erased permanently.

1. Locate the **charging station** found inside the same orange case that the total station is stored in and plug it into an outlet.
2. Locate the **battery pockets** on both sides of the Total Station. Unlock **ONLY ONE** of them and take out **ONLY ONE** of the batteries.
3. Place the battery into the charging station, with **the female components of the battery** match up with the **male components of the charging station**, making sure to place the **back part in first** and resting the **components together last**. An orange light should turn on, indicating that the battery is being charged.
4. Once the battery has been fully charged and a green light is on, **push back on the battery**, and **lift up the front portion**, pulling out the battery.
5. Place the battery into the Total Station once more, with the **front of the battery going in first**, matching up the **female components of the battery** with the **male components of the Total Station**.
6. Afterwards, you are now able to repeat the steps above with the other battery located on the **opposite side of the total station**.

File Conversion

One thing that should be noted is that the Nikon Nivo 5.C–Series Total Station saves in **.job** format. Before you download the data from the Total Station, you must convert to the desired format.

1. Power on the **Nikon Nivo 5.C–Series Total Station** by pressing the **red power button** in the top right corner next to the touch screen.
2. Double tap on **Survey Pro** to start the program.
3. There is no need to balance the unit because we are not collecting data so just hit the **green ⊗** in the top right hand corner which will take you to the **Quick Shot Menu**.
4. Tap on the **Large Folder File** on the right of the touch screen to open an existing file.
5. **Select (highlight)** the desired file you would like to convert and select **“open”**
6. Select the **green ⊗** in the top right hand corner and select **[D] Export**.
7. Select the desired format that you would like to obtain the data from
 - In this case we recommend **.txt** for **Text format** or **.csv** for **Comma Separated Values** (for excel)
8. Select **“Next”** and select the drop down menu to open the options and select **“select all points”** and select **“Next”**
9. Select the desired coordinate system (in this case, **“Plane”** is fine); select **“next”**.
10. Leave the default setting: **Name, Northing, Easting, Elevation, Description**. Select **“Finish”**
11. In the **Save As** menu, pick the desired destination and rename (if you want) the file. Once done, select the **green ⊗** in the top right corner.
12. Turn off the Nikon Nivo 5.C–Series.

Data Retrieval

Option 1: *USB Based Memory Device Transfer (Recommended)*

1. Power on the **Nikon Nivo 5.C–Series Total Station** by pressing the **red power button** in the top right corner next to the touch screen.
2. Double tap the “My Device” icon in the top left hand corner of the touch screen.
3. Insert your USB based (2.0 or 3.0) device into the female port located on the side (see above diagram).
 - Wait for your USB device to appear as “Hard Disk”
4. Double tap “Survey Pro Jobs”
5. Locate the file that you converted above. Tab and hold until a separate options window appears and select “copy”.
6. Select the back arrow in the top left corner of the touch screen
7. Use the back arrow to return to the previous folder
8. Double tap the device entitled “Hard Disk” to view the USB contents
 - Open the desired folder you would like to store the data in
 - Tab and Hold a blank space until an option window appears and select paste.
9. Repeat steps 5-8 for multiple files if needed.
10. When the data transfer is complete, select the “X” in the top right hand corner of the touch screen to exit.
11. Remove the USB device and turn off the total station.